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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,003	08/17/2004	Jason Lu	13155-US-PA	5002

31561 7590 07/26/2006

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

GARCIA, JOANNIE A

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/711,003	Applicant(s) LU, JASON	
	Examiner Joannie A. Garcia	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05-10-06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Claims 1, 4, and 5, are objected to because of the following informalities:

In claim 1, line 7, “an” before “laser beam” should be changed by --a--.

Appropriate correction is required.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by Chung et al (US 2003/0203589 A1).

The rejection is maintained as stated in the Office Action mailed 05-10-06, and as stated below.

Chung et al discloses providing a substrate 10 (Figure 1), and performing a laser marking processing operation over a surface of the substrate prior to performing a chemical mechanical polishing process, wherein at least a protrusion is formed over the surface of the substrate during the laser marking the processing operation, and wherein an energy of a laser beam of the laser marking processing operation is adjusted to reduce a step height of the protrusion compared to that without adjusting the parameter of the processing operation (Figures 1-2, and Paragraphs 0012-0015), wherein the processing operation comprises a laser marking process (Paragraph 0013).

Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung et al (US 2003/0203589 A1), in combination with Fang et al (US 2005/0158966 A1), and the following comments.

The rejection is maintained as stated in the Office Action mailed 05-10-06, and as stated below.

Chung et al discloses fabricating a shallow trench isolation comprising providing a substrate 10 (Figure 1), performing a laser marking operation to form a laser mark 20 on the substrate (Figure 2), wherein at least a protrusion is formed during the laser marking operation due to an amassment of material, and wherein a parameter of the laser marking operation is adjusted in a manner to reduce a step height of the protrusion compared to that without adjusting the parameter (Paragraphs 0012-0014), forming a patterned mask layer 12/14 over the substrate (Figure 2), etching the substrate using the patterned mask layer as an etching mask to form a trench 22 (Figure 3).

Chung et al discloses the claimed invention except for forming an insulation layer over the substrate, wherein the insulation layer completely fills the trench, removing a portion of the insulation layer by performing a chemical-mechanical polishing process, and removing the patterned mask layer. Fang et al discloses fabricating a shallow trench isolation including forming a patterned mask layer 26 over a substrate 22 (Figure 2A, and Paragraph 0020), etching the substrate using the patterned mask layer as an etching mask to form a trench 30A (Figure 2C, and Paragraph 0022), forming an insulation layer 31 over the substrate, wherein the insulation layer completely fills the trench (Figure 2D, and Paragraph 0023), removing a portion of the insulation layer by performing a chemical-mechanical polishing process (Figure 2H, and Paragraph 0027), and removing the patterned mask layer 26 (Figures 2C-2D). It would have been within the scope of ordinary skill in the art to combine the teachings of Chung et al and Fang et al, to achieve formation of a CMP insulation layer filling the trench 22 of Chung et al, and removal of

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patterned mask layer 12/14 of Chung et al, by employing the disclosed steps of Fang et al.

Chung et al discloses the claimed invention except for adjusting the energy to a level below 1000 micro Joule, and reducing the step height to a level below 4 micrometer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine a suitable energy and step height, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

In addition, the selection of a suitable energy and step height, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and *In re Aller*, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed energy and step height or any unexpected results arising therefrom. Where

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patentability it's said to be based upon particular chosen energy and step height or upon another variable recited in a claim, the Applicant must show that the chosen energy and step height are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Applicant argues that Fang et al does not teach performing a laser marking operation to form a laser mark on the substrate, wherein at least a protrusion is formed during the laser marking operation due to an amassment of material, and wherein an energy of a laser beam of the laser marking operation is adjusted to reduce a step height of the protrusion compared to that without adjusting the parameter. However, Fang et al is not relied upon for that purpose.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joannie García whose telephone number is (571) 272-1861. The examiner can normally be reached on Monday through Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JAG
July 20, 2006

GFourson
Primary Examiner



George Fourson
Primary Examiner
Art Unit 2823